

# Fai parlare il tuo codice: Observability in .NET con OpenTelemetry

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# Sponsor






# Cos'è l'Observability

*«Un sistema è osservabile se, conoscendo le uscite (output) del sistema per un determinato periodo di tempo, è possibile determinare completamente il suo stato interno.»*

Kálmán, R.E. (1960). "On the general theory of control systems"

# Observability nel software

-  capire stato funzionamento applicazione
-  capire stato interno senza aggiungere nuovo codice
-  rispondere a domande non previste

# Observability != Monitoring







# OpenTelemetry



# OpenTelemetry

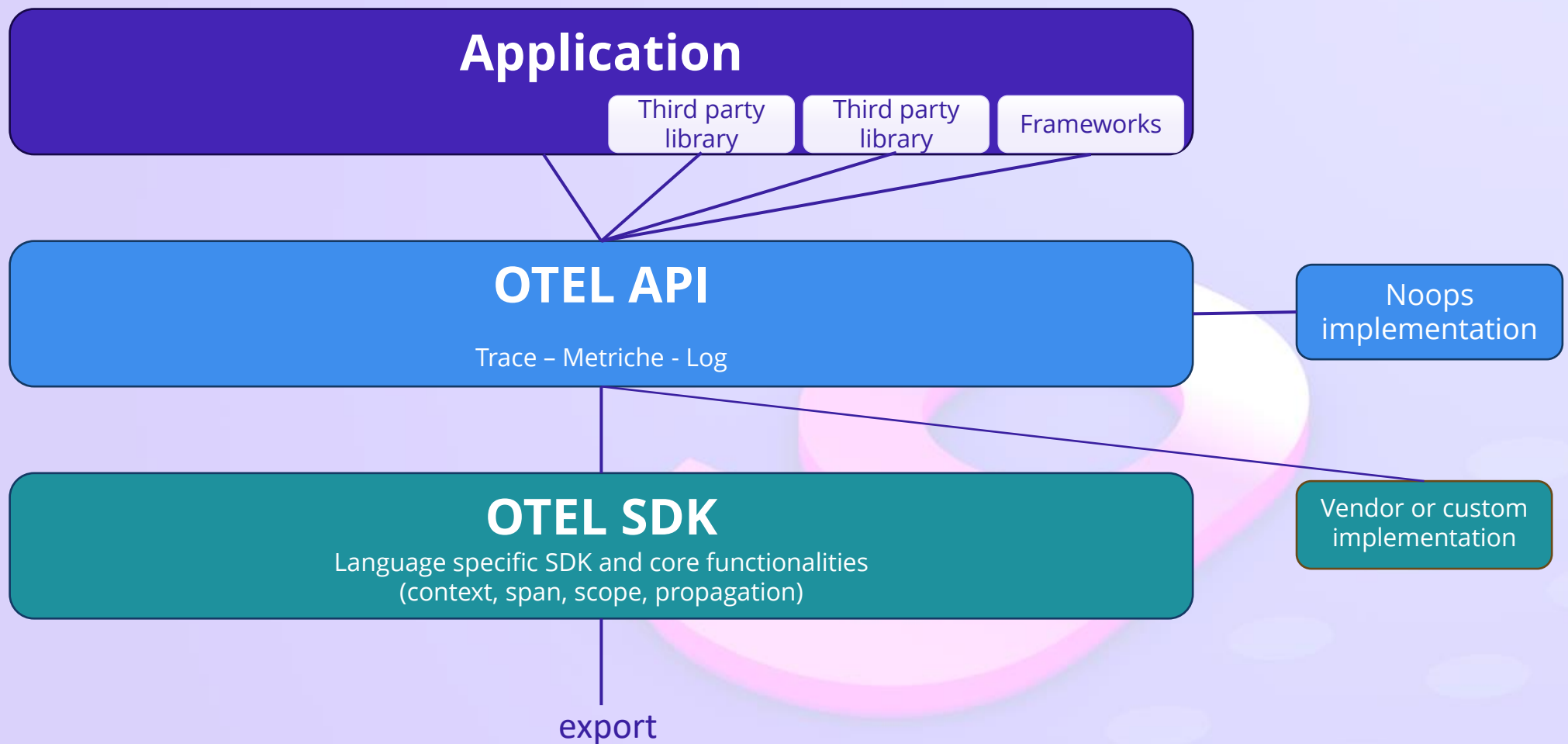
È un progetto della Cloud Native Computing Foundation (CNCF), lo stesso ecosistema di Kubernetes e Prometheus

Fornisce un unico standard per raccogliere e inviare dati osservabili a qualsiasi backend

Vendor neutral e supportato dalle maggiori aziende

Standard de facto





# Signals

TRACES

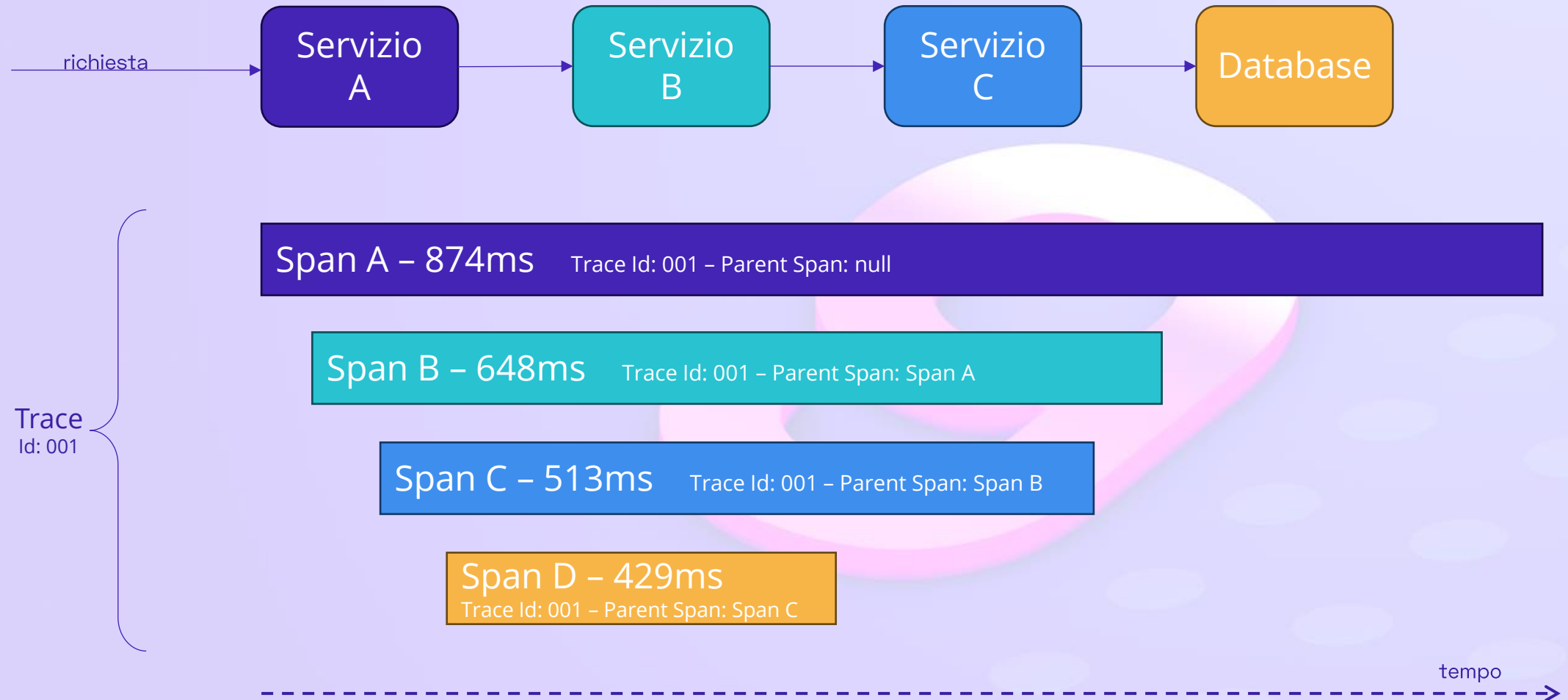
METRICHE

LOG

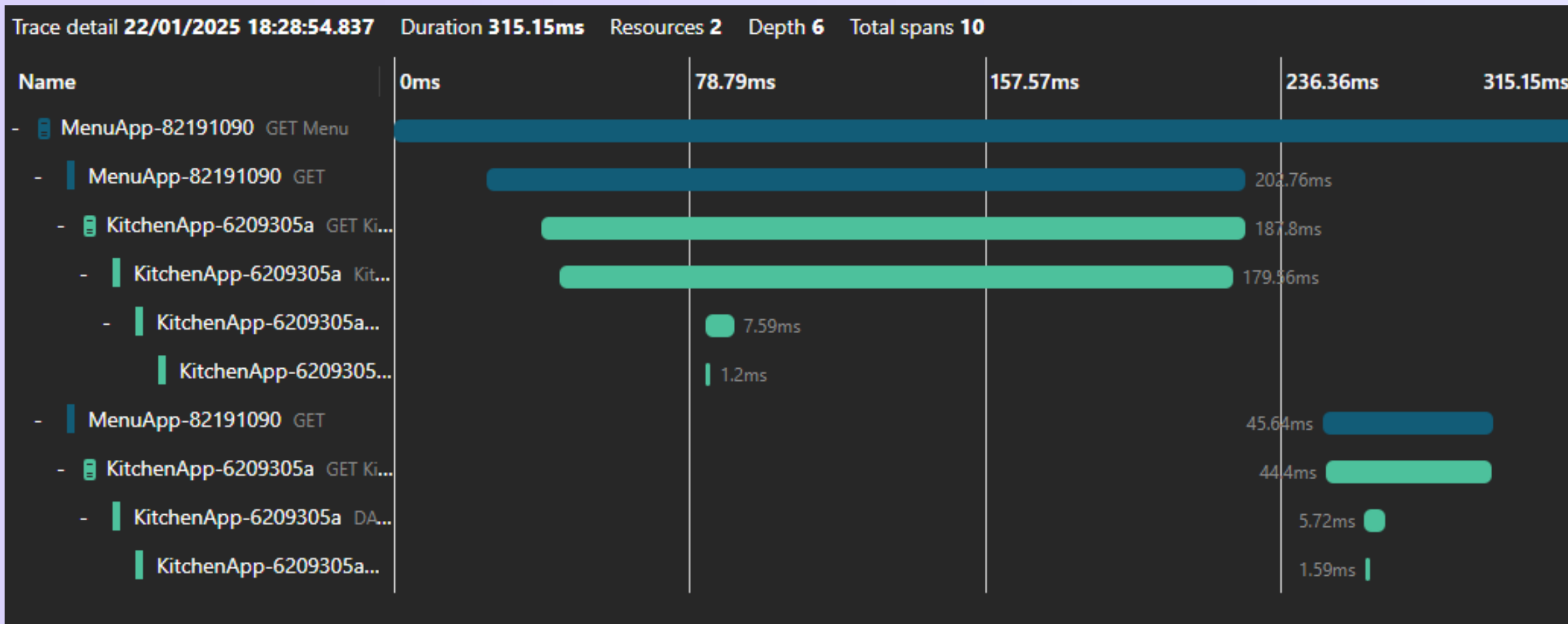
BAGGAGE

PROFILING

# Trace



# Trace



# Metriche

Rappresentazione numerica delle performance o dello stato

**Counter:** può solo aumentare (es. conteggio richieste http)

**Gauge:** valori che possono variare nel tempo (es. cpu)

**Histogram:** distribuzione dei valori numerici (es. latenza)

# Log

Eventi accaduti nel sistema, con timestamp e contesto

Non strutturati vs strutturati



# Contesto



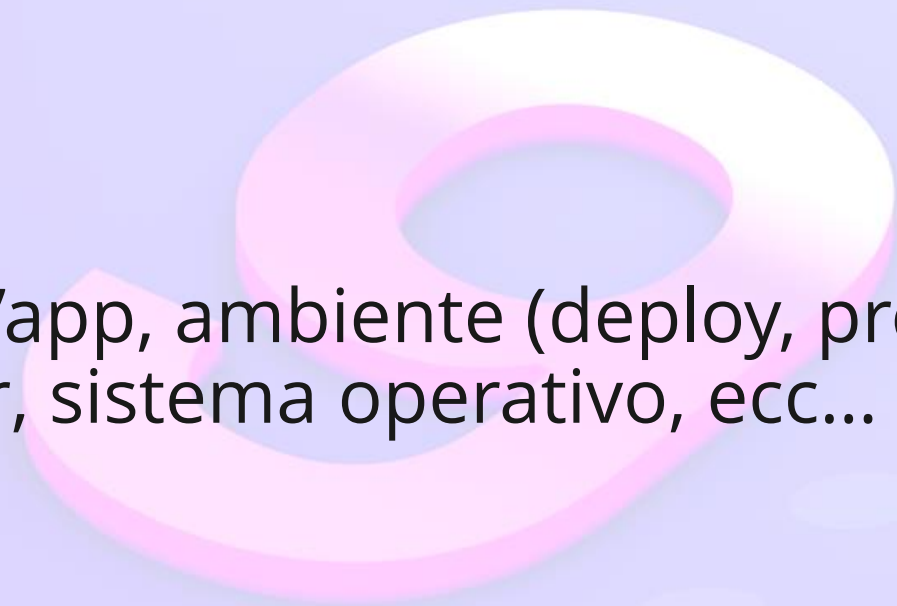


# Resource

Entità che sta generando la telemetria

Composta da set di attributi

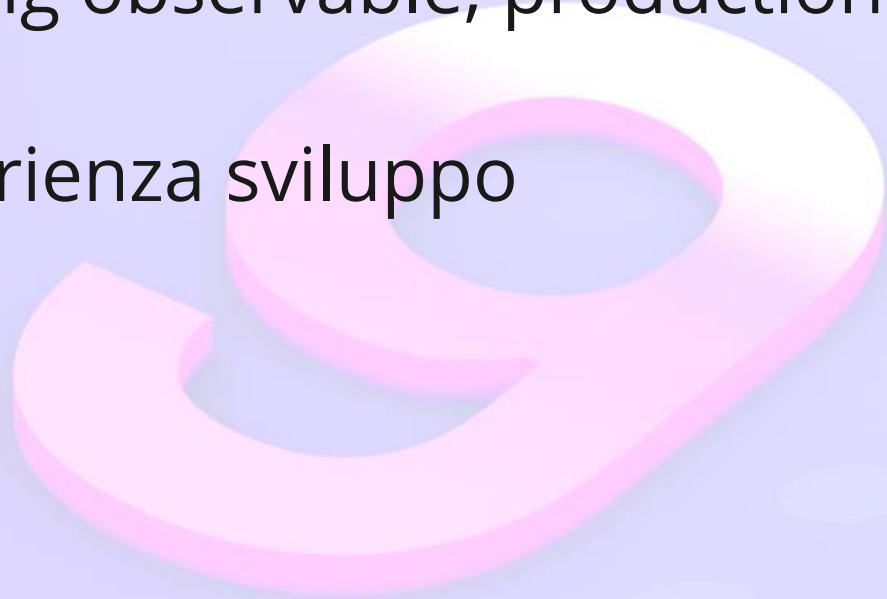
Esempi: nome e versione dell'app, ambiente (deploy, prod), cluster, region, cloud provider, sistema operativo, ecc...



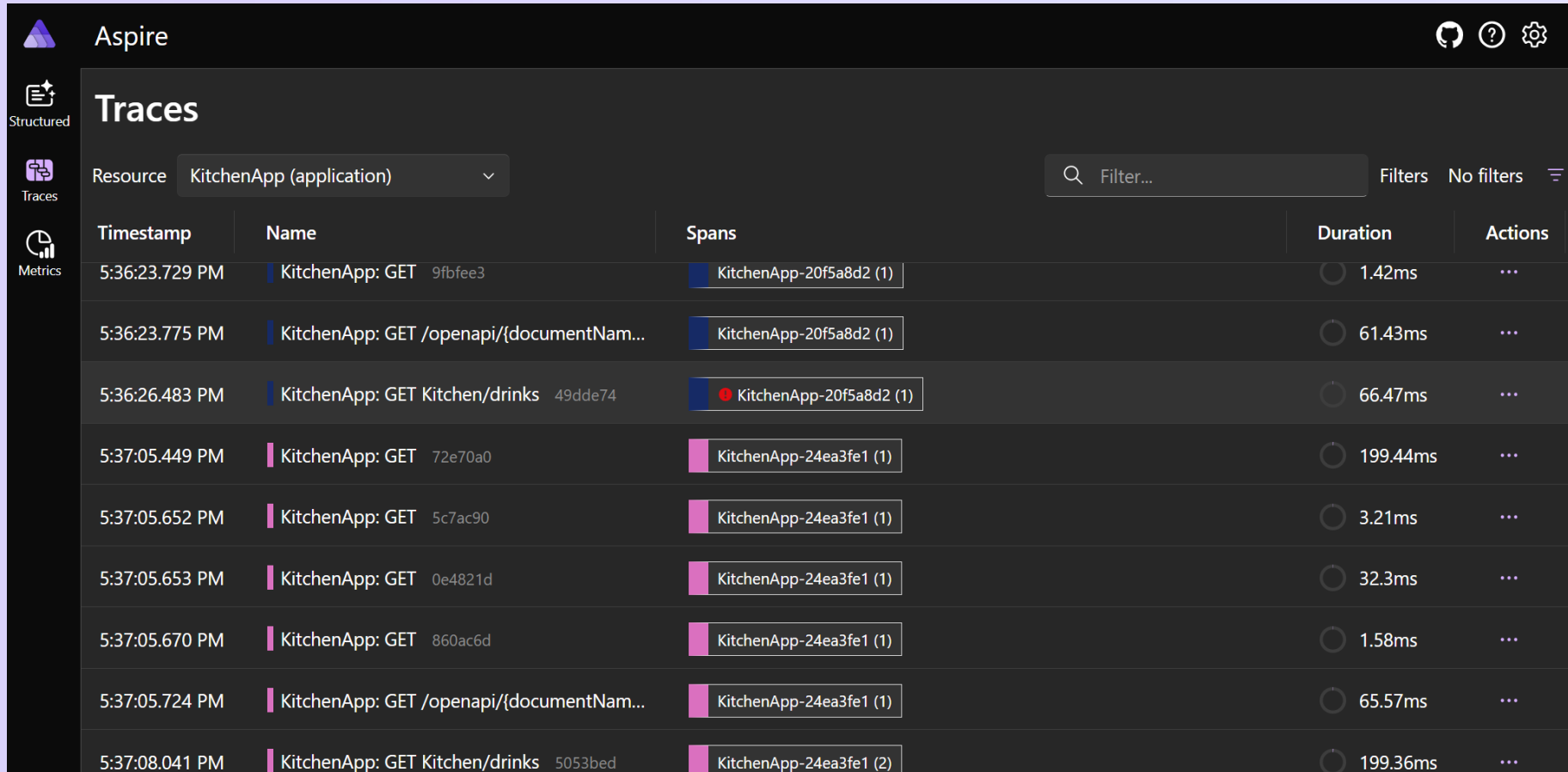


# .NET Aspire

- “cloud ready stack for building observable, production ready, distributed applications”
- pensato per migliorare esperienza sviluppo
- orchestrazione
- template di progetto e tool



# Aspire dashboard



The screenshot shows the Aspire dashboard with the 'Traces' view selected. The left sidebar contains navigation icons for 'Structured', 'Traces', and 'Metrics'. The main area displays a table of traces for the 'KitchenApp (application)' resource. The table has columns for 'Timestamp', 'Name', 'Spans', 'Duration', and 'Actions'. The 'Spans' column shows a tree view of the trace spans, with some spans highlighted in blue or pink. The 'Duration' column shows the total duration of the trace in milliseconds. The 'Actions' column contains a three-dot menu icon for each trace.

Timestamp	Name	Spans	Duration	Actions
5:36:23.729 PM	KitchenApp: GET 9fbfee3	KitchenApp-20f5a8d2 (1)	1.42ms	...
5:36:23.775 PM	KitchenApp: GET /openapi/{documentNam...	KitchenApp-20f5a8d2 (1)	61.43ms	...
5:36:26.483 PM	KitchenApp: GET Kitchen/drinks 49dde74	KitchenApp-20f5a8d2 (1)	66.47ms	...
5:37:05.449 PM	KitchenApp: GET 72e70a0	KitchenApp-24ea3fe1 (1)	199.44ms	...
5:37:05.652 PM	KitchenApp: GET 5c7ac90	KitchenApp-24ea3fe1 (1)	3.21ms	...
5:37:05.653 PM	KitchenApp: GET 0e4821d	KitchenApp-24ea3fe1 (1)	32.3ms	...
5:37:05.670 PM	KitchenApp: GET 860ac6d	KitchenApp-24ea3fe1 (1)	1.58ms	...
5:37:05.724 PM	KitchenApp: GET /openapi/{documentNam...	KitchenApp-24ea3fe1 (1)	65.57ms	...
5:37:08.041 PM	KitchenApp: GET Kitchen/drinks 5053bed	KitchenApp-24ea3fe1 (2)	199.36ms	...

# Aspire standalone dashboard

```
docker run --rm -it -d          -p 18888:18888          -p 4317:18889  
--name aspire-dashboard        mcr.microsoft.com/dotnet/aspire-  
dashboard:9.0
```

<https://learn.microsoft.com/en-us/dotnet/aspire/fundamentals/dashboard/standalone>



# OTLP Exporter

Esportazione dati tramite OTLP (OpenTelemetry Protocol)

Configurazioni:

- Endpoint
- Protocollo (gRPC o HTTP/protobuf)
- Header (api-key o altre config)



# Demo



# Aggiungere OTEL (v1.10-1.11)

```
dotnet add package OpenTelemetry.Extensions.Hosting
```

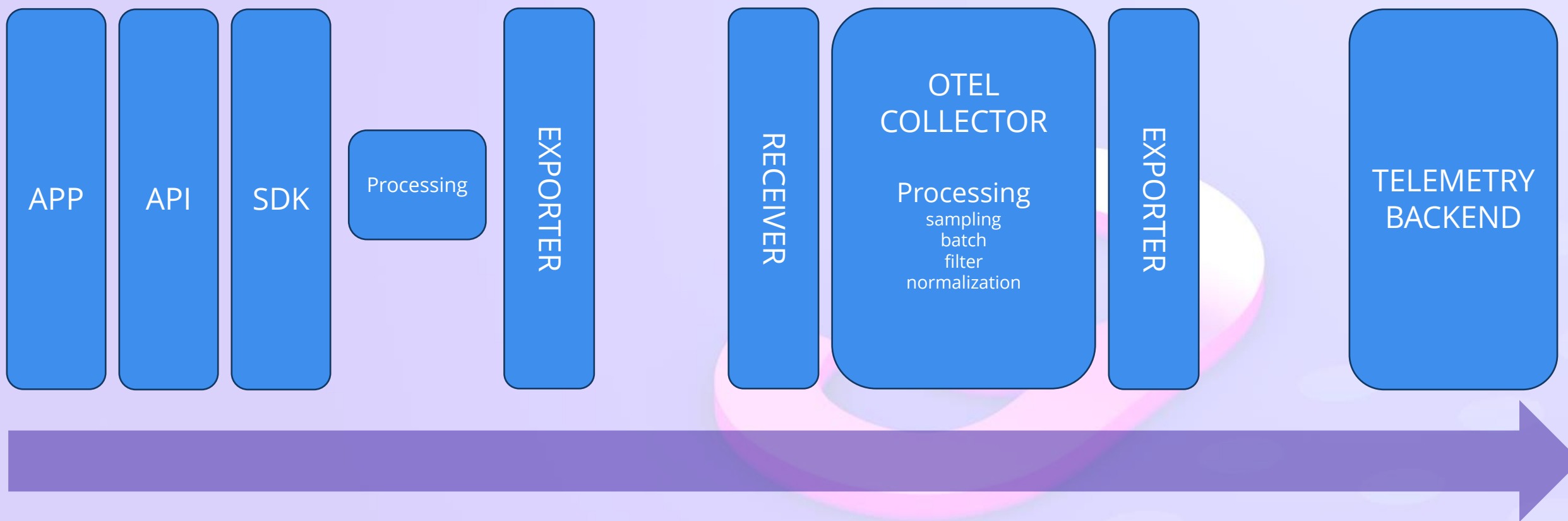
```
dotnet add package OpenTelemetry.Instrumentation.AspNetCore
```

```
dotnet add package OpenTelemetry.Instrumentation.Http
```

```
dotnet add package  
OpenTelemetry.Exporter.OpenTelemetryProtocol
```

```
dotnet add package OpenTelemetry.Exporter.Console
```



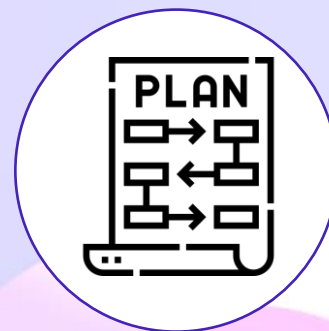




Troubleshooting



Miglioramento  
performance

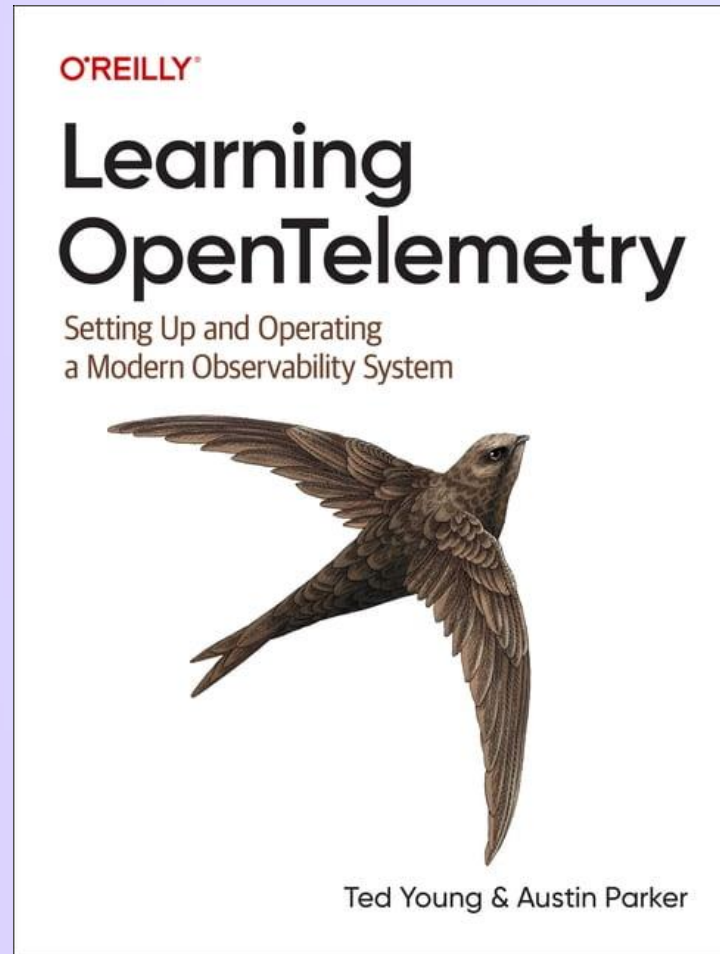


Decisioni  
strategiche  
prodotto



Onboarding  
rapido

# About & resources



# About & resources



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